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SITREP

THE NPS MARITIME DEFENSE AND SECURITY RESEARCH PROGRAM NEWSLETTER

<http://www.nps.edu/Research/mdsr/index.html>



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Dear Readers,

PLEASE submit a short 200-300-word article introducing your organization's Maritime Security and Defense-related mission and activities or add an event to our calendar.

Contact Ms. Rita Painter at rpainte@nps.edu.

Pacific's Rapid Image Exploitation Resource (RAPIER) Ship Detection System Update

John Stastny, from the Space and Naval Warfare (SPAWAR) Systems Center Pacific, recently completed a 3 month TDY at the NATO Undersea Research Centre (NURC), in La Spezia, Italy. Mr. Stastny has been at SPAWAR Systems Center Pacific for over two years after completing a Master's of Science degree from the University of Illinois, Champagne-Urbana, focusing his studies on signal and image processing. During his time at NURC he developed novel Synthetic Aperture Radar (SAR) ship detection algorithms for the RAPIER Ship Detection System in collaboration with leaders in the SAR field at NURC.

RAPIER is being developed at SPAWAR Systems Center Pacific as a framework for satellite image processing and automatic target recognition. RAPIER automates the process of detecting and classifying ships in overhead electro-optical (EO) and SAR images of bodies of water, coastlines and ports using digital image processing algorithms. This output includes the image chip, ship type classification with confidence rating, and the length, width, heading, latitude and longitude of each detected ship. KML files (for overlay onto Google Earth) and OTH-Gold and RIT reports are also produced automatically.

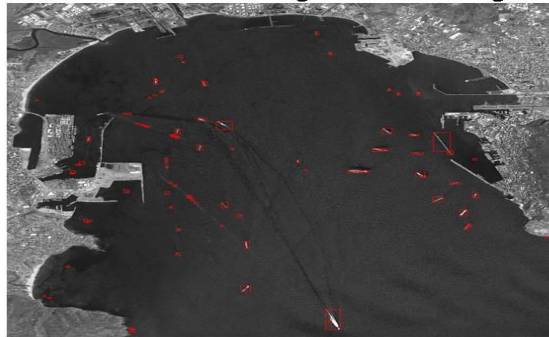
In addition to algorithm development, Mr. Stastny participated in Maritime Security 2009 (MS09), a large sea trial collecting a wide range of data (AIS, Radar, SAR imagery). Real time fusion of this data was performed during the experiment and provided operationally to analysts at CC Mar Naples, demonstrating the utility of multi-INT data fusion. During this experiment Mr. Stastny compared results from four SAR ship detection algorithms, developed by other countries, on data collected during the MS09 experiment. Initial results show RAPIER performed on par or better than other algorithms, depending on the imagery type.

(Previous article published in SITREP Vol 34. Contact rpainte@nps.edu for copy).
Contact Program Manager: Heidi Buck, heidi.buck@navy.mil, for more details.



RAPIER Ship Detection System

Problem: Searching for a particular ship in satellite imagery is a difficult and time consuming task for the image analyst.



Solution: The SSC San Diego Ship Detection Algorithms *quickly* and *accurately* locate ships in EO satellite (commercial and NTM) imagery.



The Office of the Director of National Intelligence (ODNI) is pleased to present the inaugural report on the status of the Global Maritime and Air Communities of Interest intelligence enterprises and the level of integration and collaboration achieved since the mission's inception.

This report draws on input and data from the Intelligence Community (IC), Interagency, government commissions, public policy research institutions and private industry to make the widest possible assessment of the mission's status. It covers the initial development of the two communities of interest, steps taken to integrate, align and synchronize related activities throughout the IC, and progress made in inculcating and engendering a climate of collaboration between federal, state, tribal and local governments while reaching out to the private sector and our foreign partners. ODNI is leading this transformative effort based on the foundational guidance and direction of the National Commission on Terrorist Attacks Upon the United States (9/11 Commission), the Intelligence Reform and Terrorism Prevention Act of 2004 (IRTPA), and on related national strategies and plans focused on maritime and air security. Achievement of these objectives is contingent upon efficient and effective intelligence integration and information sharing in order to "connect the dots" in advance and anticipate threats before they materialize. We seek to create a decisive advantage that prevents a catastrophic attack against our people, economy, or our interests abroad. Contained within this report are the comprehensive details of IC, Interagency and private sector efforts to meet those objectives. They comprise the first steps toward an advanced state of intelligence integration and information sharing to optimally support all levels of government regarding the maritime and air domains.

The ODNI has achieved initial success in establishing the framework for increased governmental unity of effort, and for deconflicting and optimizing IC maritime and air resources. For example, the ODNI recently stood-up a National Maritime Intelligence Center and shifted related intelligence activities and positions from ODNI. However, challenges in closing institutional gaps and seams remain, especially as we pursue similar efforts in the air domain. These critical endeavors must be sustained to proactively deal with dangerous and adaptive enemies. The stakes for success in this venture could not be higher. For the physical security of our Homeland and its citizenry, and for the economy that sustains our way of life.

Executive Summary Global Maritime and Air Intelligence Integration Inaugural Report

This constitutes the first report on the status of the Global Maritime and Air Intelligence Communities of Interest intelligence enterprises, and on the strategic progress of Global Maritime and Air Intelligence Integration (GMAII).

GMAII is a result of the 9/11 Commission's efforts to seek an integrated Intelligence Community (IC) able to "connect the dots" in advance to prevent a catastrophic terrorist attack on the Homeland. The immediacy of this mission is reflected in the persistent threat of global terrorism that has continued to exist since the Commission's findings. Exacerbating the situation is the fact that our economic vulnerability has increased due to greater dependence on international trade and the onset of the global economic downturn.

The economy's inherent lack of resiliency to a major Global Supply Chain (GSC) disruption event and the current fragility of the world's economy presents a substantial opportunity for those who seek to attack our institutions asymmetrically. Our enemies' ultimate goal would be to create a "tipping point" that results in a cascade effect toward economic chaos and political destabilization on a global scale. One potential scenario would include an attack on one or more maritime ports using a Weapon of Mass Destruction (WMD) or a Radiological Dispersal Device (RDD). The stringent precautions required (and most likely demanded) to prevent another such attack would bring global trade to a halt, threatening the world with economic collapse and resultant trans-continental political instability. Those circumstances could be brought about by the use of the GSC as a means of weapons delivery, or a direct attack on its intermodal jugular points. It is instructive to note that when West Coast ports, including the Port of Long Beach, were shut down for just 10 days due to a contract dispute in 2002, it resulted in a loss to the U.S. economy of between \$10 billion and \$20 billion.

The Commission on the Prevention of WMD Proliferation and Terrorism reported in December 2008 that "unless the world community acts decisively and with great urgency, it is more likely than not that a weapon of mass destruction will be used in a terrorist attack somewhere in the world by the end of 2013." Further, we assess that al-Qaeda continues to pursue plans for Homeland attacks and is likely focusing on prominent political, economic, and infrastructure targets designed to produce mass casualties, visually dramatic destruction, significant economic aftershocks, and/or fear among the population. The Office of the Director of National Intelligence (ODNI) has worked with a heightened sense of urgency since October 2006 to enable the prevention of such an attack and other potential threats from the maritime and air domains by laying the foundation to implement the Global Maritime Intelligence Integration (GMII) and Air Domain Surveillance and Intelligence Integration (ADSII) Plans. The two domain missions are summed into a single overarching mission goal: "To expeditiously enable anticipation and thereby prevention of catastrophic attack (from maritime, air and other intermodal domains) on the Homeland, United States persons, and our interests worldwide."

The ODNI furthered that goal by developing a vision and executing a strategy to rapidly create an integrated maritime and air intelligence capability that improves U.S. national security against current and emerging threats. Corrective measures require integration, alignment and synchronization, without which, crucial opportunities for prevention or an early response to an adverse event could be lost with unacceptable consequences. Six strategic objectives comprise the supporting strategy:

- Provide leadership for maritime, air, and ultimately, transportation domain intelligence integration;
- Develop the construct and architecture to support information sharing;
- Build global communities of interest for all-source intelligence integration in the maritime and air domains to develop familiarity, leverage partnerships and facilitate concerted team-work that is marshaled against the challenge;
- Integrate maritime and air intelligence/information sharing throughout the communities of interest, and ensure rapid and effective dissemination of intelligence to provide decision advantage to leadership and deepen understanding at all levels / departments of government;
- Enable IC members to quickly eliminate critical gaps and enhance enterprise agility; and
- Assess the process and make policy adjustments if necessary to ensure achievement of goals and objectives.

The Global Maritime Community of Interest (GMCOI) has begun to take form, as evidenced by the ODNI's stand-up of the new National Maritime Intelligence Center (NMIC), and by increased cooperation and engagement with the maritime industry, our Commonwealth Allies and foreign partners. However, Global Air Domain Community of Interest (GADCOI) intelligence integration activities are not at the same level of maturity as those of the maritime domain. Challenges remain in both communities to overcome cultural and institutional resistance, and we must stay the course and accelerate transformative efforts to realize meaningful reform. IC observations and recommendations for potential improvements include:

- Reestablish urgency to proactively transform the enterprises to defeat an agile enemy.
- Reaffirm information sharing as a top priority to quickly advance the closing of institutional gaps and seams through increased opportunity for authorized discovery of information.
- Exercise Intelligence Reform and Terrorism Prevention Act (IRTPA) authorities through advisory tasking to further engage the Interagency to improve government-wide collaboration and unity of effort.
- Recommit to the tenets of IRTPA's Information Sharing Environment.
- Stress the primacy of improved enterprise architecture and data standards.
- Use the Maritime Domain Awareness (MDA) Interagency Solutions Analysis (IASA) Plan as an integrated update to the MDA Interagency Investment Strategy (IAIS).
- Develop an Interagency human intelligence cadre for maritime and air intelligence.
- Develop Interagency maritime and air intelligence analyst training

and education to improve focused analysis resulting in responsive and incisive understanding.

- Create a formal mechanism for intelligence sharing amongst the GCMOI, GADCOI and the National Intelligence Council's (NIC) Committee on Foreign Investment in the U.S. (CFIUS) Support Group.
- Exercise the ODNI NMIC to determine metrics on gap closures and its ability to support the Maritime Operational Threat Response (MOTR) Plan.
- Develop a governance structure for Air Domain Awareness (ADA).
- Advance the requirement for an air domain integrated capability analogue to the NMIC.

Threats that terrorists and other illicit actors pose to the nation's ports, waterways and air-ways remain persistent and grave, leaving no room for error or delay in this effort. We must proactively leverage our partnerships to ferret out threats and address them before an attack or other disruption effort is launched on the U.S., our Allies, or our interests abroad. Only through an inclusive, collaborative approach can we gain the critical information that lies outside of traditional intelligence collection that will create responsive and incisive understanding leading to preventative measures and threat interdiction. ODNI has provided the national level Interagency leadership and guidance necessary to synchronize this effort.

**Article contributed by Timothy A. Phillips, timothy.a.phillips@ugov.gov
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Future Events:

Please provide your inputs for inclusion in the next SITREP. Email: rpainte@nps.edu

The LIBRARIAN'S CORNER— [Greta Marlatt, gmarlatt@nps.edu](mailto:gmarlatt@nps.edu)

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- Director of National Intelligence (DNI) report "[The Inaugural Report of the Global Maritime and Air Communities of Interest Intelligence Enterprises](#)"
- Government Accountability Office (GAO) report - "[Homeland Security: DHS's Progress and Challenges in Key Areas of Maritime, Aviation, and Cybersecurity, GAO-10-106](#)"
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